

Doctoral workshop as part of the "Public Administration" program offered by the University of Lausanne, the University of Berne and the University of Lugano

KPM Center for Public Management in Bern

Basics of Partial Least Squares-Structural Equation Modeling (PLS-SEM)

Introduction

The two-day workshop introduces the participants to the basics of Partial Least Squares-Structural Equation Modeling using the SmartPLS 3 software. PLS-SEM is a method that aims to maximize the declared variance of dependent constructs in the path model. Compared to other SEM approaches, PLS-SEM allows researchers to estimate simultaneously very complex models with many constructs and indicator variables in a single coherent model. In addition, PLS-SEM enables the modeling of reflective and formative constructs and usually offers a lot of flexibility with regard to data requirements.

PLS-SEM has received a lot of attention in recent years. This can be seen, for example, from a large number of overview studies, such as Human Resource Management (Ringle et al., 2018), Hospitality Research (Ali et al., 2018), Information Systems Research (Hair et al., 2017a), Management Accounting (Nitzl, 2016), International Business (Richter et al., 2016), Tourism (do Valle and Assaker, 2016), Supply Chain Management (Kaufmann and Gaeckler, 2015), Family Business (Sarstedt et al., 2014), Operations Management (Peng and Lai, 2012), Strategic Management (Hair et al., 2012a), Marketing (Hair et al., 2012b), Management Information Systems (Ringle et al., 2012), Accounting (Lee et al., 2011) und International Marketing (Henseler et al., 2009).

However, there are only a few studies and no reviews in the areas of public administration or health care management, although in recent years a frequent application of PLS-SEM can also be observed in these areas. Against this background, Avkiran (2018) states in his article on PLS-SEM in Health Care Management that the advantages and disadvantages of PLS-SEM are not yet fully understood. Avkiran (2018) explains in his contribution, using PLS-SEM modelling as an example, how the overall quality of care (a latent construct) is achieved by including other latent constructs such as low care (e.g. in dormitories) and high care (e.g. in nursing homes) as part of an elderly care network.

Instructor

Dr. Christian Nitzl is a senior researcher at the Bundeswehr University Munich with research interest in the application of statistical methods, in particular structural equation models, with a special focus on accounting in public institutions. He has published in *Acta Astronautica*, *Business Research*, *Financial Accountability & Management*, *Hospital Pharmacy*, *Industrial Management & Data Systems*, *Journal of Accounting Literature*, *Journal of Accounting & Organizational Change*, *Journal of Banking & Finance*, *Journal of Public and Nonprofit Management*, *Public Management Review* and *Business Administration*. He has also worked as a reviewer for top tier journals such as *BMC Medical Informatics & Decision Making*, *Business & Information Systems Engineering*, *Decision Sciences*, *European Management Journal*, *Internet Research*, *Industrial Management & Data Systems*, *Journal of Long Range Planning*, and many others.

Aim of the course

The aim of the course is to familiarize participants with the possibilities and limitations of using PLS-SEM in their research.

The objectives of the course are:

- (1) The detailed methodological introduction to the PLS-SEM approach and into the type of causal modelling,
- (2) the evaluation and assessment of measurement and structural models; and
- (3) the introduction of complementary analytical techniques.

Objectives and agenda

The course aims at lecturers and doctoral students who are interested in applying PLS-SEM in their own research. Basic knowledge of multivariate statistics is helpful but not required. On the second day, course participants who already have a research project are asked to present it, especially with regard to model theoretical challenges. Afterwards, it will be discussed how these can be mapped in a structural equation model.

An access code to the Software SmartPLS will be provided to the students at the beginning of the course and will be valid for 60 days. The various exercises are carried out using the software. The textbook "A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)" by Hair et al. (2017b) as well as the basic explanations by Nitzl (2010) "A User-Oriented Introduction to the Partial Least Square (PLS) Method" are recommended as a basis for the course and for preparation. The latter source can be downloaded free of charge from the following link: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2097324

Date	Time	Content
Oct 16, 2019	09:00 - 10:30	Fundamentals of structural equation modeling
	11:00 - 12:30	The characteristics of latent variables and the specification of the measurement model (reflective / formative)
	13:30 - 15:00	Introduction to PLS-SEM and the SmartPLS Software
	15:30 - 17:00	Evaluation of measurement models & SmartPLS exercise
Oct 17, 2019	09:00 - 10:30	Evaluation of the structural model & SmartPLS exercise
	11:00 - 12:30	Discussion of research projects (Part 1)
	13:30 - 15:00	Discussion of research projects (Part 2)

Assignment and ECTS to be earned

Students can earn 2 graded ECTS in total for attendance to the course and an assignment. For the assignment, the students may choose between writing a theoretical and an applied short paper reflecting the lessons learnt. For the theoretical paper, the students will have to review the literature that applies PLS in their field and assess those papers based on the learnings of the course. For the applied paper, the students will have to write about their own research and reflect on the learnings of the course. The assignment must be submitted no later than three months after the end of the course, i.e., January 16, 2020 via email to the instructor Christian Nitzl (christian.nitzl@unibw.de).

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